

# Rammed earth a healthy choice

Nothing compares to natural building materials to create a warm, healthy home, and among the best is one of the oldest house building materials known to mankind: earth.

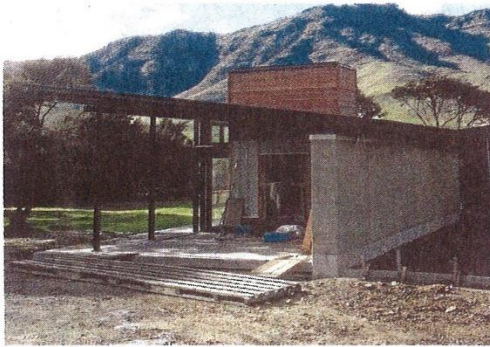
One of the South Island's – if not New Zealand's – leading exponent of rammed earth construction is Down to Earth Building. The Wanaka-based building company has built more than 50 houses throughout the South Island over the past 17 years. They are becoming more popular as homebuilders appreciate the qualities of earth as a building material.

Builder Jimmy Cotter, who owns and operates the business with his wife, Rebecca, explains some of the benefits of building a house with rammed earth.

"Rammed earth houses have been built for thousands of years which proves their enduring strength. It is an entirely natural product and does not have to be treated with toxic chemicals to maintain its longevity which can be measured in hundreds of years."

It has excellent insulation properties, he says, due to the high thermal mass so the interior temperature and humidity levels remain at healthy levels year round. "The internal temperature of one of our houses barely changes 5 degrees Celsius year round whereas with a timber-framed house the interior temperature can easily vary between 15 and 20 degrees Celsius over a year. Condensation levels are also very low."

These qualities combined



**Natural construction:** A rammed earth house built by Down to Earth Building at Pigeon Bay, Banks Peninsula.

means a rammed earth home is ideal for people with allergies or ailments such as asthma.

The benefits don't stop there either, according to Cotter: "Because the walls of the houses we build are 450 millimetres thick, they are also extremely quiet – little external noise enters and there is minimal transference of noise between rooms."

Another advantage over conventional timber framed houses is their lack of maintenance. "The walls are virtually maintenance free and also require no internal or external finishing."

Rammed earth houses have also proven their durability in the face of Christchurch's earthquakes. All rammed earth houses constructed in and around the city performed extremely well, according to feedback from the New Zealand Earth Building Association.

"Because of their weight and inherent strength, rammed earth houses tend to sway with the land rather than be torn apart by seismic movement," Cotter says.

The building material also lends itself to an almost infinite range of building styles, he says.

"Rammed earth is unrivalled when it comes to versatility. You can build a house with an ultra-modern looking lounge and traditional farm-house style kitchen, for example, and they will blend beautifully. The earth just softens everything."

A range of finishes are also possible, ranging from very smooth to coarse, depending of the type of earth used.

Rammed earth also lends itself to additional personalisation.

"If the owner likes we can put recesses in the walls to display artworks. We have incorporated wine racks, wrought iron and empty bottles into walls for some of our clients."

Although earth is in theory a universally available building material, Cotter builds most of his houses using soil from a particular place in the Cardrona Valley which he says has particularly good consistency, strength and colour. "It is a lovely soil and it works very well," he says.

Because of the inherent weight of rammed earth walls, a concrete foundation is essential into which is inserted 12mm diameter steel reinforcing rods for the walls.

The walls themselves are formed using what are essentially giant moulds known as formworks made out of plywood. The earth has to be shovelled into the moulds by hand and then compressed using a piston rammer every 100mm of solid depth. Space is made for windows by leaving a gap between two moulds the width of the window. The spaces between the top and bottom of the window hole filled with separate moulds.

Unlike concrete, Cotter says once the formwork is removed the wall is finished and at full strength. "You don't have to wait a week for the earth to dry."

Although relatively time-consuming work, Cotter can build two walls a day for an average-sized house and says many of his clients also pitch in to help shovel the earth. "I think people get a sense of achievement when they know they have helped build some of their own house. It connects them more to their home."

Once the walls are in place, virtually any roofing option can be installed.

Although Cotter estimates a rammed earth walled house costs about 5 per cent more than a conventional house, he says this extra cost is more than offset by the benefits. "You get a much more comfortable house to live in year round which is healthier and is virtually maintenance free. It also has a look and feel which cannot be replicated by any other building material."